Name_____ Date_____

5.6 – Indirect Proofs (Part 2)

Complete the first step of an indirect proof of the given statement.

1) There are fewer than 11 pencils in the box.

   Assume temporarily that there are _____ pencils in the box.

2) If a number ends in 0, then it is not divisible by 3.

   Assume temporarily that a number that ends in 0 _____ .

3) $4x + 3 > 12$

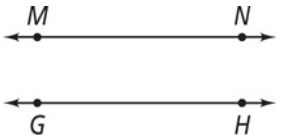
   Assume temporarily that $4x + 3$_____12.

4) ΔRST is not an isosceles triangle.

   Assume temporarily that _____ .

5) I. $\overleftrightarrow{MN} \parallel \overleftrightarrow{GH}$ II. $\overleftrightarrow{MN}$ and $\overleftrightarrow{GH}$ do not intersect. III. $\overleftrightarrow{MN}$ and $\overleftrightarrow{GH}$ are skew.

6) To start, identify two conditions that cannot be true at the same time.



   _____ lines must be in the same plane.

   _____ lines must not be in the same plane.

   Therefore, two lines cannot be both _____ and _____.

Fill in the blanks to indirectly prove the following statements.

7) If the Yoga club and Go Green Club together have fewer than 20 members and the Go Green club has 10 members, then the Yoga Club has fewer than 10 members.

   Given: The total membership of the Yoga Club and Go Green Club is fewer than 20. The Go Green Club has 10 members.

   Prove: The Yoga club has fewer than 10 members.

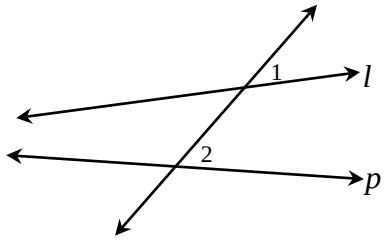
   Proof: Assume temporarily that the Yoga Club has 10 or more members. This means that together the two clubs have _____ members. This contradicts the given information that _____ _____. The temporary assumption is false.

   Therefore, it is true that _____.

Write an indirect proof for each.

8) Given: $\angle 1 \neq \angle 2$

Prove : l is not parallel to p



9) Given: ΔABC with $BC > AC$

Prove : $m\angle A \neq m\angle B$

10) Given: ΔXYZ is isosceles

Prove : Neither of the base angles is a right angle.

For the following, write a convincing argument that uses indirect reasoning.

11) Ice is forming on the sidewalk in front of Toni's house. Show that the temperature of the sidewalk surface must be 0°C or lower.

12) Your class has fewer than 30 students. The teacher divides your class into two groups. The first group has 15 students. Show that the second group must have fewer than 15 students.

13) Show that an obtuse triangle cannot contain a right angle.